42. The pulse oximeter of Claim 41, wherein the adaptive system uses a least squares algorithm.

43. The pulse oximeter of Claim 42, wherein the adaptive system comprises an adaptive noise canceler.

44. The pulse oximeter of Claim 43, wherein the adaptive system uses a least squares lattice.

Sub B1 Cont

45. The pulse oximeter of Claim 41, further comprising a display to display the oxygen saturation.

46. A pulse oximeter comprising:

at least first and second light emitting devices;

at least one light detector configured to receive light attenuated by transmission through a living tissue with arterial blood, the light detector generating a first signal based on light transmitted from the first light emitting device and a second signal based on light transmitted from the second light emitting device;

a filter responsive to signals representing the first and second signals to provide first and second filtered output signals, wherein the filter monitors its own output performance and adjusts its own transfer function to optimize its filter performance; and

a processor responsive to the first and the second filtered output signals to calculate oxygen saturation.

47. The pulse oximeter of Claim 46, wherein the filter uses a least squares algorithm to adjust its transfer function.

48. The pulse oximeter of Claim 47, wherein the filter is an adaptive noise canceler.

49. The pulse oximeter of Claim 48, wherein the filter is a least squares lattice.

50. The pulse oximeter of Claim 46, wherein the filter uses a least means squares algorithm.

51. The pulse oximeter of Claim 46, further comprising a display to display the oxygen saturation.

52. A method of calculating blood oxygen saturation comprising the steps of: transmitting light of at least first and second wavelengths through body tissue carrying blood to a light-sensitive detector to generate first and second signals;

filing the first and the second signals to provide first and second filtered output signals, wherein the filtering comprises monitoring the performance of the filtering at an output by closed-loop action, and in response, adjusting a filtering transfer function to optimize said first filtered output signal; and

calculating oxygen saturation based upon said first and second filtered output signals.

53. The method of Claim 52, wherein the filtering uses a least squares algorithm to adjust the transfer function.

54. The method of Claim 52, wherein the filtering uses a least means squares algorithm to adjust the transfer function.

55. The method of Claim 52, wherein the filtering uses a least squares lattice.

56. The method of Claim 52, wherein the filtering uses an adaptive noise canceler.

57. The method of Claim 52, further comprising displaying the oxygen saturation.

58. A pulse oximeter comprising:

a light emitter adapted to emit light of at least first and second wavelengths;

at least one light detector configured to receive light attenuated by transmission through a living tissue with arterial pulsing blood, the light detector acquiring a first signal based on the first wavelength and a second signal based on the second wavelength;

an analog to digital converter that digitizes the first and the second signals to produce digitized first and second signals;

an adaptive system responsive to the first and the second digitized signals to produce adaptively filtered first and second signals; and

a processor responsive to the adaptively filtered first and second signals to calculate oxygen saturation.

59. The pulse oximeter of Claim 58, wherein the adaptive system uses a least squares algorithm.

60. The pulse oximeter of Claim 58, wherein the adaptive system is configured as a least squares lattice.

61. The pulse oximeter of Claim 58, wherein the adaptive system is configured as an adaptive noise canceler.